

SEQUENCE LISTING

<110> EXELIXIS, INC.

<120> MAPKs AS MODIFIERS OF THE RAC, AXIN, AND BETA-CATENIN PATHWAYS
AND METHODS OF USE

<130> EX03-089C-PC

<150> US 60/429,061

<151> 2002-11-25

<150> US 60/437,163

<151> 2002-12-30

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cgttcgaacc agtgaagaga gtggagccct tggactcaat ggagaagaaa attgctcaga	3540
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caatgttaac ccactctatg tctctcctgc atgtaaaaaa ccactaatcc acatgtatga	3900
aaaggagttc acttctgaga tctgctgtgg ttctttgtgg ggagtcaatt tgctgttggg	3960

aacccgatct	aatctataatc	tcatggacag	aagtggaaag	gctgacatta	ctaaacttat	4020
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ctcaggtcat	aagaacagac	ttcgggtgta	tcatctgacc	tggttgagga	acaagattt	4140
gaataatgat	ccagaaaagta	aaagaaggca	agaagaaaatg	ctgaagacag	aggaagcctg	4200
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gaaccggttt	aagagaccag	atgagctcct	tcatttgctg	aagctcaagg	tatccaaac	4500
acttgatcat	aagccagtga	cagttgacct	ggctatttgt	tctgaaaaaaaa	gactaaagat	4560
tttcttcagc	tcagcagatg	gatatcacct	catcgatgca	aatctgagg	ttatgtctga	4620
tgtgaccctg	ccaaagaatc	ccctggaaat	cattatacca	cagaatatca	tcattttacc	4680
tgattgcttg	ggaattggca	tgatgctcac	cttcaatgct	gaagccctct	ctgtggaagc	4740
aatgaacaa	ctcttcaaga	agatccttga	aatgtggaaa	gacataccat	cttctatagc	4800
tttgaatgt	acacagcgaa	ccacaggatg	gggccaaaaag	gccattgaag	tgcgtcttt	4860
gcaatccagg	gttctggaaa	gtgagctgaa	gcmcaggtca	attaagaagc	tgagattcct	4920
gtgcacccgg	ggtgacaagc	tgttctttac	ctctaccctg	cgcaatcacc	acagccgggt	4980
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tccagtgatt	tattaccaca	ttataaacat	catgtatagg	cagtctgcat	cttcagattt	5100
cagagattaa	atgagtattc	agttttat	ttagtaaaga	ttaaatccaa	aactttactt	5160
ttaatgtgc	acagaatagt	tttaatgaga	aatgcagctt	tatgtataaa	attaaactata	5220
gcaagctcta	ggtactccaa	tggtgtacaa	tgtctttgc	acaaaactttg	taactttgt	5280
tactgtgaat	tcaaacatta	ctcttggac	agtttggaca	gtatctgtat	tcagatttt	5340
caacatggag	taaagaaaacc	tgttatgaat	tagattacaa	gcagcctca	aaagaattgg	5400
cactggata	agattttca	ggaaaagaaa	aacatcgca	aacta		5445

<210> 36
 <211> 1331
 <212> PRT
 <213> Homo sapiens

<400> 36

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser
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Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg
 65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly
 85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
 100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu
 115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu
 130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
 145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
 165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
 180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala
 195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile
 210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
 225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys
 245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys
 260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe
275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu
305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Asn Asp Ser Gly
325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg
340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu
355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys
370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu
385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Arg Arg Glu Lys Glu Leu Arg
405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg
420 425 430

Arg Glu Glu Glu Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg
435 440 445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu
450 455 460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu
465 470 475 480

Gln Arg Pro Val Glu Lys Pro Leu Tyr His Tyr Lys Glu Gly Met
485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser
500 505 510

Arg Leu Asn Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn
515 520 525

Arg Ile Ser Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile
530 535 540

Ser Gly Val Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp
545 550 555 560

Pro Gln Ile Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu
565 570 575

Thr Ala Ser Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly
580 585 590

Phe Gln Glu Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg
595 600 605

Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile
610 615 620

Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro
625 630 635 640

Pro Lys Val Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg
645 650 655

Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser
660 665 670

Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile
675 680 685

Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser
690 695 700

Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly
705 710 715 720

Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys
725 730 735

Ser Glu Gly Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro
740 745 750

Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Ser Tyr Lys
755 760 765

Lys Ala Ile Asp Glu Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu
770 775 780

Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr
785 790 795 800

Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Asp
805 810 815

Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro
820 825 830

Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val
835 840 845

Gly Met Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe
850 855 860

Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser
865 870 875 880

Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly
885 890 895

His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly
900 905 910

Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met
915 920 925

Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe
930 935 940

Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu
945 950 955 960

Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu
965 970 975

Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser
980 985 990

Val Val Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro
995 1000 1005

Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys
1010 1015 1020

Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Asn Gly
1025 1030 1035

Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Asn Leu
1040 1045 1050

Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu
1055 1060 1065

Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn Lys Leu Arg Val
1070 1075 1080

Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His Asn Asp Pro
1085 1090 1095

Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp Leu Glu
1100 1105 1110

Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe
1115 1120 1125

Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala
1130 1135 1140

Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp
1145 1150 1155

Leu Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly
1160 1165 1170

Gln Arg Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val
1175 1180 1185

Ile Asp Val Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser
1190 1195 1200

His Ile Gln Gly Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro
1205 1210 1215

Lys Thr Asp Gly Met Glu Met Leu Val Cys Tyr Glu Asp Glu Gly
1220 1225 1230

Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu
1235 1240 1245

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn
 1250 1255 1260

Gln Ile Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val
 1265 1270 1275

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln
 1280 1285 1290

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala
 1295 1300 1305

Ser Val Arg Ser Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu
 1310 1315 1320

Asn Arg Asn Ser Met Met Asn Trp
 1325 1330

<210> 37
 <211> 1166
 <212> PRT
 <213> Homo sapiens

<400> 37

Met Ala Asn Asp Ser Pro Ala Lys Ser Leu Val Asp Ile Asp Leu Ser
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Ser Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Val Val Gly
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu
 50 55 60

Glu Ile Lys Leu Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg
 65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly
 85 90 95

His Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
 100 105 110

Ile Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Asp

115

120

125

Trp Ile Ala Tyr Ile Ser Arg Glu Ile Leu Arg Gly Leu Ala His Leu
 130 135 140

His Ile His His Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
 145 150 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
 165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
 180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala
 195 200 205

Thr Tyr Asp Tyr Arg Ser Asp Leu Trp Ser Cys Gly Ile Thr Ala Ile
 210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
 225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys
 245 250 255

Lys Trp Ser Lys Lys Phe Phe Ser Phe Ile Glu Gly Cys Leu Val Lys
 260 265 270

Asn Tyr Met Gln Arg Pro Ser Thr Glu Gln Leu Leu Lys His Pro Phe
 275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
 290 295 300

His Ile Asp Arg Thr Arg Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Val Pro Glu Gln
 325 330 335

Glu Gly Glu Pro Ser Ser Ile Val Asn Val Pro Gly Glu Ser Thr Leu
 340 345 350

Arg Arg Asp Phe Leu Arg Leu Gln Gln Glu Asn Lys Glu Arg Ser Glu
 355 360 365

Ala Leu Arg Arg Gln Gln Leu Leu Gln Glu Gln Gln Leu Arg Glu Gln
 370 375 380

Glu Glu Tyr Lys Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu
 385 390 395 400

Gln Gln Lys Glu Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu
 405 410 415

Arg Glu Ala Arg Arg Gln Gln Glu Arg Glu Gln Arg Arg Arg Glu Gln
 420 425 430

Glu Glu Lys Arg Arg Leu Glu Glu Leu Glu Arg Arg Arg Lys Glu Glu
 435 440 445

Glu Glu Arg Arg Arg Ala Glu Glu Glu Lys Arg Arg Val Glu Arg Glu
 450 455 460

Gln Glu Tyr Ile Arg Arg Gln Leu Glu Glu Gln Arg His Leu Glu
 465 470 475 480

Val Leu Gln Gln Gln Leu Leu Gln Glu Gln Ala Met Leu Leu His Asp
 485 490 495

His Arg Arg Pro His Pro Gln His Ser Gln Gln Pro Pro Pro Pro Gln
 500 505 510

Gln Glu Arg Ser Lys Pro Ser Phe His Ala Pro Glu Pro Lys Ala His
 515 520 525

Tyr Glu Pro Ala Asp Arg Ala Arg Glu Val Pro Val Arg Thr Thr Ser
 530 535 540

Arg Ser Pro Val Leu Ser Arg Arg Asp Ser Pro Leu Gln Gly Ser Gly
 545 550 555 560

Gln Gln Asn Ser Gln Ala Gly Gln Arg Asn Ser Thr Ser Ser Ile Glu
 565 570 575

Pro Arg Leu Leu Trp Glu Arg Val Glu Lys Leu Val Pro Arg Pro Gly
 580 585 590

Ser Gly Ser Ser Ser Gly Ser Ser Asn Ser Gly Ser Gln Pro Gly Ser
 595 600 605

His Pro Gly Ser Gln Ser Gly Ser Gly Glu Arg Phe Arg Val Arg Ser

610

615

620

Ser Ser Lys Ser Glu Gly Ser Pro Ser Gln Arg Leu Glu Asn Ala Val
 625 630 635 640

Lys Lys Pro Glu Asp Lys Lys Glu Val Phe Arg Pro Leu Lys Pro Ala
 645 650 655

Gly Glu Val Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Ala Val Glu
 660 665 670

Asp Val Arg Pro Pro His Lys Val Thr Asp Tyr Ser Ser Ser Glu
 675 680 685

Glu Ser Gly Thr Thr Asp Glu Glu Asp Asp Asp Val Glu Gln Glu Gly
 690 695 700

Ala Asp Glu Ser Thr Ser Gly Pro Glu Asp Thr Arg Ala Ala Ser Ser
 705 710 720

Leu Asn Leu Ser Asn Gly Glu Thr Glu Ser Val Lys Thr Met Ile Val
 725 730 735

His Asp Asp Val Glu Ser Glu Pro Ala Met Thr Pro Ser Lys Glu Gly
 740 745 750

Thr Leu Ile Val Arg Gln Thr Gln Ser Ala Ser Ser Thr Leu Gln Lys
 755 760 765

His Lys Ser Ser Ser Ser Phe Thr Pro Phe Ile Asp Pro Arg Leu Leu
 770 775 780

Gln Ile Ser Pro Ser Ser Gly Thr Thr Val Thr Ser Val Val Gly Phe
 785 790 795 800

Ser Cys Asp Gly Met Arg Pro Glu Ala Ile Arg Gln Asp Pro Thr Arg
 805 810 815

Lys Gly Ser Val Val Asn Val Asn Pro Thr Asn Thr Arg Pro Gln Ser
 820 825 830

Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile
 835 840 845

Leu Cys Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Ser
 850 855 860

Gly Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Pro Leu
 865 870 875 880

Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn
 885 890 895

Val Leu Val Thr Ile Ser Gly Lys Lys Asp Lys Leu Arg Val Tyr Tyr
 900 905 910

Leu Ser Trp Leu Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu
 915 920 925

Lys Lys Gln Gly Trp Thr Thr Val Gly Asp Leu Glu Gly Cys Val His
 930 935 940

Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu
 945 950 955 960

Lys Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys
 965 970 975

Phe Met Ala Phe Lys Ser Phe Gly Glu Leu Val His Lys Pro Leu Leu
 980 985 990

Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Tyr Gly
 995 1000 1005

Ser Cys Ala Gly Phe His Ala Val Asp Val Asp Ser Gly Ser Val
 1010 1015 1020

Tyr Asp Ile Tyr Leu Pro Thr His Val Arg Lys Asn Pro His Ser
 1025 1030 1035

Met Ile Gln Cys Ser Ile Lys Pro His Ala Ile Ile Ile Leu Pro
 1040 1045 1050

Asn Thr Asp Gly Met Glu Leu Leu Val Cys Tyr Glu Asp Glu Gly
 1055 1060 1065

Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu
 1070 1075 1080

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile Arg Ser Asn
 1085 1090 1095

Gln Thr Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val

1100

1105

1110

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln
 1115 1120 1125

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala
 1130 1135 1140

Ser Val Arg Ser Gly Gly Ser Ser Gln Val Tyr Phe Met Thr Leu
 1145 1150 1155

Gly Arg Thr Ser Leu Leu Ser Trp
 1160 1165

<210> 38
 <211> 1295
 <212> PRT
 <213> Homo sapiens

<400> 38

Met Gly Asp Pro Ala Pro Ala Arg Ser Leu Asp Asp Ile Asp Leu Ser
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Val Val Gly
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg
 65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly
 85 90 95

Asn Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
 100 105 110

Val Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Ala Leu Lys Glu Asp
 115 120 125

Cys Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ala His Leu
 130 135 140

His Ala His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala
195 200 205

Thr Tyr Asp Tyr Arg Ser Asp Ile Trp Ser Leu Gly Ile Thr Ala Ile
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys
245 250 255

Lys Trp Ser Lys Lys Phe Ile Asp Phe Ile Asp Thr Cys Leu Ile Lys
260 265 270

Thr Tyr Leu Ser Arg Pro Pro Thr Glu Gln Leu Leu Lys Phe Pro Phe
275 280 285

Ile Arg Asp Gln Pro Thr Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
290 295 300

His Ile Asp Arg Ser Arg Lys Lys Arg Gly Glu Lys Glu Glu Thr Glu
305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Asp Asp Ser His Gly Glu Glu
325 330 335

Gly Glu Pro Ser Ser Ile Met Asn Val Pro Gly Glu Ser Thr Leu Arg
340 345 350

Arg Glu Phe Leu Arg Leu Gln Gln Glu Asn Lys Ser Asn Ser Glu Ala
355 360 365

Leu Lys Gln Gln Gln Leu Gln Gln Gln Gln Arg Asp Pro Glu
370 375 380

Ala His Ile Lys His Leu Leu His Gln Arg Gln Arg Arg Ile Glu Glu
385 390 395 400

Gln Lys Glu Glu Arg Arg Arg Val Glu Glu Gln Gln Arg Arg Glu Arg
405 410 415

Glu Gln Arg Lys Leu Gln Glu Lys Glu Gln Gln Arg Arg Leu Glu Asp
420 425 430

Met Gln Ala Leu Arg Arg Glu Glu Glu Arg Arg Gln Ala Glu Arg Glu
435 440 445

Gln Glu Tyr Lys Arg Lys Gln Leu Glu Glu Gln Arg Gln Ser Glu Arg
450 455 460

Leu Gln Arg Gln Leu Gln Gln Glu His Ala Tyr Leu Lys Ser Leu Gln
465 470 475 480

Gln Gln Gln Gln Gln Gln Leu Gln Lys Gln Gln Gln Gln Leu
485 490 495

Leu Pro Gly Asp Arg Lys Pro Leu Tyr His Tyr Gly Arg Gly Met Asn
500 505 510

Pro Ala Asp Lys Pro Ala Trp Ala Arg Glu Val Glu Glu Arg Thr Arg
515 520 525

Met Asn Lys Gln Gln Asn Ser Pro Leu Ala Lys Ser Lys Pro Gly Ser
530 535 540

Thr Gly Pro Glu Pro Pro Ile Pro Gln Ala Ser Pro Gly Pro Pro Gly
545 550 555 560

Pro Leu Ser Gln Thr Pro Pro Met Gln Arg Pro Val Glu Pro Gln Glu
565 570 575

Gly Pro His Lys Ser Leu Val Ala His Arg Val Pro Leu Lys Pro Tyr
580 585 590

Ala Ala Pro Val Pro Arg Ser Gln Ser Leu Gln Asp Gln Pro Thr Arg
595 600 605

Asn Leu Ala Ala Phe Pro Ala Ser His Asp Pro Asp Pro Ala Ile Pro
610 615 620

Ala Pro Thr Ala Thr Pro Ser Ala Arg Gly Ala Val Ile Arg Gln Asn
625 630 635 640

Ser Asp Pro Thr Ser Glu Gly Pro Gly Pro Ser Pro Asn Pro Pro Ala
645 650 655

Trp Val Arg Pro Asp Asn Glu Ala Pro Pro Lys Val Pro Gln Arg Thr
660 665 670

Ser Ser Ile Ala Thr Ala Leu Asn Thr Ser Gly Ala Gly Gly Ser Arg
675 680 685

Pro Ala Gln Ala Val Arg Ala Ser Asn Pro Asp Leu Arg Arg Ser Asp
690 695 700

Pro Gly Trp Glu Arg Ser Asp Ser Val Leu Pro Ala Ser His Gly His
705 710 715 720

Leu Pro Gln Ala Gly Ser Leu Glu Arg Asn Arg Val Gly Val Ser Ser
725 730 735

Lys Pro Asp Ser Ser Pro Val Leu Ser Pro Gly Asn Lys Ala Lys Pro
740 745 750

Asp Asp His Arg Ser Arg Pro Gly Arg Pro Ala Asp Phe Val Leu Leu
755 760 765

Lys Glu Arg Thr Leu Asp Glu Ala Pro Arg Pro Pro Lys Lys Ala Met
770 775 780

Asp Tyr Ser Ser Ser Glu Glu Val Glu Ser Ser Glu Asp Asp Glu
785 790 795 800

Glu Glu Gly Glu Gly Pro Ala Glu Gly Ser Arg Asp Thr Pro Gly
805 810 815

Gly Arg Ser Asp Gly Asp Thr Asp Ser Val Ser Thr Met Val Val His
820 825 830

Asp Val Glu Glu Ile Thr Gly Thr Gln Pro Pro Tyr Gly Gly Thr
835 840 845

Met Val Val Gln Arg Thr Pro Glu Glu Glu Arg Asn Leu Leu His Ala
850 855 860

Asp Ser Asn Gly Tyr Thr Asn Leu Pro Asp Val Val Gln Pro Ser His
865 870 875 880

Ser Pro Thr Glu Asn Ser Lys Gly Gln Ser Pro Pro Ser Lys Asp Gly
885 890 895

Ser Gly Asp Tyr Gln Ser Arg Gly Leu Val Lys Ala Pro Gly Lys Ser
900 905 910

Ser Phe Thr Met Phe Val Asp Leu Gly Ile Tyr Gln Pro Gly Gly Ser
915 920 925

Gly Asp Ser Ile Pro Ile Thr Ala Leu Val Gly Gly Glu Gly Thr Arg
930 935 940

Leu Asp Gln Leu Gln Tyr Asp Val Arg Lys Gly Ser Val Val Asn Val
945 950 955 960

Asn Pro Thr Asn Thr Arg Ala His Ser Glu Thr Pro Glu Ile Arg Lys
965 970 975

Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly
980 985 990

Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg
995 1000 1005

Ser Gly Gln Gly Lys Val Tyr Gly Leu Ile Gly Arg Arg Arg Phe
1010 1015 1020

Gln Gln Met Asp Val Leu Glu Gly Leu Asn Leu Leu Ile Thr Ile
1025 1030 1035

Ser Gly Lys Arg Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu
1040 1045 1050

Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln
1055 1060 1065

Gly Trp Thr Thr Val Gly Asp Met Glu Gly Cys Gly His Tyr Arg
1070 1075 1080

Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys
1085 1090 1095

Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys
1100 1105 1110

Phe Met Ala Phe Lys Ser Phe Ala Asp Leu Pro His Arg Pro Leu
1115 1120 1125

Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile
 1130 1135 1140

Tyr Gly Ser Ser Ala Gly Phe His Ala Val Asp Val Asp Ser Gly
 1145 1150 1155

Asn Ser Tyr Asp Ile Tyr Ile Pro Val His Ile Gln Ser Gln Ile
 1160 1165 1170

Thr Pro His Ala Ile Ile Phe Leu Pro Asn Thr Asp Gly Met Glu
 1175 1180 1185

Met Leu Leu Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr
 1190 1195 1200

Gly Arg Ile Ile Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro
 1205 1210 1215

Thr Ser Val Ala Tyr Ile Cys Ser Asn Gln Ile Met Gly Trp Gly
 1220 1225 1230

Glu Lys Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp
 1235 1240 1245

Gly Val Phe Met His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys
 1250 1255 1260

Glu Arg Asn Asp Lys Val Phe Phe Ala Ser Val Arg Ser Gly Gly
 1265 1270 1275

Ser Ser Gln Val Tyr Phe Met Thr Leu Asn Arg Asn Cys Ile Met
 1280 1285 1290

Asn Trp
 1295

<210> 39
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 <212> PRT
 <213> Homo sapiens

<400> 39

Met Ala Gly Pro Gly Gly Trp Arg Asp Arg Glu Val Thr Asp Leu Gly
 1 5 10 15

His Leu Pro Asp Pro Thr Gly Ile Phe Ser Leu Asp Lys Thr Ile Gly
 20 25 30

Leu Gly Thr Tyr Gly Arg Ile Tyr Leu Gly Leu His Glu Lys Thr Gly
 35 40 45

Ala Phe Thr Ala Val Lys Val Met Asn Ala Arg Lys Thr Pro Leu Pro
 50 55 60

Glu Ile Gly Arg Arg Val Arg Val Asn Lys Tyr Gln Lys Ser Val Gly
 65 70 75 80

Trp Arg Tyr Ser Asp Glu Glu Asp Leu Arg Thr Glu Leu Asn Leu
 85 90 95

Leu Arg Lys Tyr Ser Phe His Lys Asn Ile Val Ser Phe Tyr Gly Ala
 100 105 110

Phe Phe Lys Leu Ser Pro Pro Gly Gln Arg His Gln Leu Trp Met Val
 115 120 125

Met Glu Leu Cys Ala Ala Gly Ser Val Thr Asp Val Val Arg Met Thr
 130 135 140

Ser Asn Gln Ser Leu Lys Glu Asp Trp Ile Ala Tyr Ile Cys Arg Glu
 145 150 155 160

Ile Leu Gln Gly Leu Ala His Leu His Ala His Arg Val Ile His Arg
 165 170 175

Asp Ile Lys Gly Gln Asn Val Leu Leu Thr His Asn Ala Glu Val Lys
 180 185 190

Leu Val Asp Phe Gly Val Ser Ala Gln Val Ser Arg Thr Asn Gly Arg
 195 200 205

Arg Asn Ser Phe Ile Gly Thr Pro Tyr Trp Met Ala Pro Glu Val Ile
 210 215 220

Asp Cys Asp Glu Asp Pro Arg Arg Ser Tyr Asp Tyr Arg Ser Asp Val
 225 230 235 240

Trp Ser Val Gly Ile Thr Ala Ile Glu Met Ala Glu Gly Ala Pro Pro
 245 250 255

Leu Cys Asn Leu Gln Pro Leu Glu Ala Leu Phe Val Ile Leu Arg Glu
 260 265 270

Ser Ala Pro Thr Val Lys Ser Ser Gly Trp Ser Arg Lys Phe His Asn

275

280

285

Phe Met Glu Lys Cys Thr Ile Lys Asn Phe Leu Phe Arg Pro Thr Ser
290 295 300

Ala Asn Met Leu Gln His Pro Phe Val Arg Asp Ile Lys Asn Glu Arg
305 310 320

His Val Val Glu Ser Leu Thr Arg His Leu Thr Gly Ile Ile Lys Lys
325 330 335

Arg Gln Lys Lys Gly Ile Pro Leu Ile Phe Glu Arg Glu Glu Ala Ile
340 345 350

Lys Glu Gln Tyr Thr Val Arg Arg Phe Arg Gly Pro Ser Cys Thr His
355 360 365

Glu Leu Leu Arg Leu Pro Thr Ser Ser Arg Cys Arg Pro Leu Arg Val
370 375 380

Leu His Gly Glu Pro Ser Gln Pro Arg Trp Leu Pro Asp Arg Glu Glu
385 390 395 400

Pro Gln Val Gln Ala Leu Gln Gln Leu Gln Gly Ala Ala Arg Val Phe
405 410 415

Met Pro Leu Gln Ala Leu Asp Ser Ala Pro Lys Pro Leu Lys Gly Gln
420 425 430

Ala Gln Ala Pro Gln Arg Leu Gln Gly Ala Ala Arg Val Phe Met Pro
435 440 445

Leu Gln Ala Gln Val Lys Ala Lys Ala Ser Lys Pro Leu Gln Met Gln
450 455 460

Ile Lys Ala Pro Pro Arg Leu Arg Arg Ala Ala Arg Val Leu Met Pro
465 470 475 480

Leu Gln Ala Gln Val Arg Ala Pro Arg Leu Leu Gln Val Gln Ser Gln
485 490 495

Val Ser Lys Lys Gln Gln Ala Gln Thr Gln Thr Ser Glu Pro Gln Asp
500 505 510

Leu Asp Gln Val Pro Glu Glu Phe Gln Gly Gln Asp Gln Val Pro Glu
515 520 525

Gln Gln Arg Gln Gly Gln Ala Pro Glu Gln Gln Arg His Asn Gln
530 535 540

Val Pro Glu Gln Glu Leu Glu Gln Asn Gln Ala Pro Glu Gln Pro Glu
545 550 555 560

Val Gln Glu Gln Ala Ala Glu Pro Ala Gln Ala Glu Thr Glu Ala Glu
565 570 575

Glu Pro Glu Ser Leu Arg Val Asn Ala Gln Val Phe Leu Pro Leu Leu
580 585 590

Ser Gln Asp His His Val Leu Leu Pro Leu His Leu Asp Thr Gln Val
595 600 605

Leu Ile Pro Val Glu Gly Gln Thr Glu Gly Ser Pro Gln Ala Gln Ala
610 615 620

Trp Thr Leu Glu Pro Pro Gln Ala Ile Gly Ser Val Gln Ala Leu Ile
625 630 635 640

Glu Gly Leu Ser Arg Asp Leu Leu Arg Ala Pro Asn Ser Asn Asn Ser
645 650 655

Lys Pro Leu Gly Pro Leu Gln Thr Leu Met Glu Asn Leu Ser Ser Asn
660 665 670

Arg Phe Tyr Ser Gln Pro Glu Gln Ala Arg Glu Lys Ser Lys Val
675 680 685

Ser Thr Leu Arg Gln Ala Leu Ala Lys Arg Leu Ser Pro Lys Arg Phe
690 695 700

Arg Ala Lys Ser Ser Trp Arg Pro Glu Lys Leu Glu Leu Ser Asp Leu
705 710 715 720

Glu Ala Arg Arg Gln Arg Arg Gln Arg Arg Trp Glu Asp Ile Phe Asn
725 730 735

Gln His Glu Glu Glu Leu Arg Gln Val Asp Lys Asp Lys Glu Asp Glu
740 745 750

Ser Ser Asp Asn Asp Glu Val Phe His Ser Ile Gln Ala Glu Val Gln
755 760 765

Ile Glu Pro Leu Lys Pro Tyr Ile Ser Asn Pro Lys Lys Ile Glu Val

770

775

780

Gln Glu Arg Ser Pro Ser Val Pro Asn Asn Gln Asp His Ala His His
785 790 795 800

Val Lys Phe Ser Ser Ser Val Pro Gln Arg Ser Leu Leu Glu Gln Ala
805 810 815

Gln Lys Pro Ile Asp Ile Arg Gln Arg Ser Ser Gln Asn Arg Gln Asn
820 825 830

Trp Leu Ala Ala Ser Glu Ser Ser Glu Glu Glu Ser Pro Val Thr
 835 840 845

Gly Arg Arg Ser Gln Ser Ser Pro Pro Tyr Ser Thr Ile Asp Gln Lys
850 855 860

Leu Leu Val Asp Ile His Val Pro Asp Gly Phe Lys Val Gly Lys Ile
865 870 875 880

Ser Pro Pro Val Tyr Leu Thr Asn Glu Trp Val Gly Tyr Asn Ala Leu
885 890 895

Ser Glu Ile Phe Arg Asn Asp Trp Leu Thr Pro Ala Pro Val Ile Gln
900 905 910

Pro Pro Glu Glu Asp Gly Asp Tyr Val Glu Leu Tyr Asp Ala Ser Ala
915 920 925

Asp Thr Asp Gly Asp Asp Asp Glu Ser Asn Asp Thr Phe Glu Asp
930 935 940

Thr Tyr Asp His Ala Asn Gly Asn Asp Asp Leu Asp Asn Gln Val Asp
 945 950 955 960

Gln Ala Asn Asp Val Cys Lys Asp His Asp Asp Asp Asn Asn Lys Phe
 965 970 975

Val Asp Asp Val Asn Asn Asn Tyr Tyr Glu Ala Pro Ser Cys Pro Arg
980 985 990

Ala Ser Tyr Gly Arg Asp Gly Ser Cys Lys Gln Asp Gly Tyr Asp Gly
 995 1000 1005

Ser Arg Gly Lys Glu Glu Ala Tyr Arg Gly Tyr Gly Ser His Thr
1010 1015 1020

Ala Asn Arg Ser His Gly Gly Ser Ala Ala Ser Glu Asp Asn Ala
 1025 1030 1035

Ala Ile Gly Asp Gln Glu Glu His Ala Ala Asn Ile Gly Ser Glu
 1040 1045 1050

Arg Arg Gly Ser Glu Gly Asp Gly Gly Lys Gly Val Val Arg Thr
 1055 1060 1065

Ser Glu Glu Ser Gly Ala Leu Gly Leu Asn Gly Glu Glu Asn Cys
 1070 1075 1080

Ser Glu Thr Asp Gly Pro Gly Leu Lys Arg Pro Ala Ser Gln Asp
 1085 1090 1095

Phe Glu Tyr Leu Gln Glu Glu Pro Gly Gly Asn Glu Ala Ser
 1100 1105 1110

Asn Ala Ile Asp Ser Gly Ala Ala Pro Ser Ala Pro Asp His Glu
 1115 1120 1125

Ser Asp Asn Lys Asp Ile Ser Glu Ser Ser Thr Gln Ser Asp Phe
 1130 1135 1140

Ser Ala Asn His Ser Ser Pro Ser Lys Gly Ser Gly Met Ser Ala
 1145 1150 1155

Asp Ala Asn Phe Ala Ser Ala Ile Leu Tyr Ala Gly Phe Val Glu
 1160 1165 1170

Val Pro Glu Glu Ser Pro Lys Gln Pro Ser Glu Val Asn Val Asn
 1175 1180 1185

Pro Leu Tyr Val Ser Pro Ala Cys Lys Lys Pro Leu Ile His Met
 1190 1195 1200

Tyr Glu Lys Glu Phe Thr Ser Glu Ile Cys Cys Gly Ser Leu Trp
 1205 1210 1215

Gly Val Asn Leu Leu Leu Gly Thr Arg Ser Asn Leu Tyr Leu Met
 1220 1225 1230

Asp Arg Ser Gly Lys Ala Asp Ile Thr Lys Leu Ile Arg Arg Arg
 1235 1240 1245

Pro Phe Arg Gln Ile Gln Val Leu Glu Pro Leu Asn Leu Leu Ile

1250

1255

1260

Thr Ile Ser Gly His Lys Asn Arg Leu Arg Val Tyr His Leu Thr
 1265 1270 1275

Trp Leu Arg Asn Lys Ile Leu Asn Asn Asp Pro Glu Ser Lys Arg
 1280 1285 1290

Arg Gln Glu Glu Met Leu Lys Thr Glu Glu Ala Cys Lys Ala Ile
 1295 1300 1305

Asp Lys Leu Thr Gly Cys Glu His Phe Ser Val Leu Gln His Glu
 1310 1315 1320

Glu Thr Thr Tyr Ile Ala Ile Ala Leu Lys Ser Ser Ile His Leu
 1325 1330 1335

Tyr Ala Trp Ala Pro Lys Ser Phe Asp Glu Ser Thr Ala Ile Lys
 1340 1345 1350

Val Cys Ile Asp Gln Ser Ala Asp Ser Glu Gly Asp Tyr Met Ser
 1355 1360 1365

Tyr Gln Ala Tyr Ile Arg Ile Leu Ala Lys Ile Gln Ala Ala Asp
 1370 1375 1380

Pro Val Asn Arg Phe Lys Arg Pro Asp Glu Leu Leu His Leu Leu
 1385 1390 1395

Lys Leu Lys Val Phe Pro Thr Leu Asp His Lys Pro Val Thr Val
 1400 1405 1410

Asp Leu Ala Ile Gly Ser Glu Lys Arg Leu Lys Ile Phe Phe Ser
 1415 1420 1425

Ser Ala Asp Gly Tyr His Leu Ile Asp Ala Glu Ser Glu Val Met
 1430 1435 1440

Ser Asp Val Thr Leu Pro Lys Asn Pro Leu Glu Ile Ile Ile Pro
 1445 1450 1455

Gln Asn Ile Ile Ile Leu Pro Asp Cys Leu Gly Ile Gly Met Met
 1460 1465 1470

Leu Thr Phe Asn Ala Glu Ala Leu Ser Val Glu Ala Asn Glu Gln
 1475 1480 1485

Leu Phe Lys Lys Ile Leu Glu Met Trp Lys Asp Ile Pro Ser Ser
1490 1495 1500

Ile Ala Phe Glu Cys Thr Gln Arg Thr Thr Gly Trp Gly Gln Lys
1505 1510 1515

Ala Ile Glu Val Arg Ser Leu Gln Ser Arg Val Leu Glu Ser Glu
1520 1525 1530

Leu Lys Arg Arg Ser Ile Lys Lys Leu Arg Phe Leu Cys Thr Arg
1535 1540 1545

Gly Asp Lys Leu Phe Phe Thr Ser Thr Leu Arg Asn His His Ser
1550 1555 1560

Arg Val Tyr Phe Met Thr Leu Gly Lys Leu Glu Glu Leu Gln Ser
1565 1570 1575

Asn Tyr Asp Val
1580

<210> 40
<211> 140
<212> PRT
<213> Homo sapiens

<400> 40

Met Ser Asp Val Thr Leu Pro Lys Asn Pro Leu Glu Ile Ile Ile Pro
1 5 10 15

Gln Asn Ile Ile Ile Leu Pro Asp Cys Leu Gly Ile Gly Met Met Leu
20 25 30

Thr Phe Asn Ala Glu Ala Leu Ser Val Glu Ala Asn Glu Gln Leu Phe
35 40 45

Lys Lys Ile Leu Glu Met Trp Lys Asp Ile Pro Ser Ser Ile Ala Phe
50 55 60

Glu Cys Thr Gln Arg Thr Thr Gly Trp Gly Gln Lys Ala Ile Glu Val
65 70 75 80

Arg Ser Leu Gln Ser Arg Val Leu Glu Ser Glu Leu Lys Arg Arg Ser
85 90 95

Ile Lys Lys Leu Arg Phe Leu Cys Thr Arg Gly Asp Lys Leu Phe Phe
100 105 110

Thr Ser Thr Leu Arg Asn His His Ser Arg Val Tyr Phe Met Thr Leu
115 120 125

Gly Lys Leu Glu Glu Leu Gln Ser Asn Tyr Asp Val
130 135 140